# Chloropicrin

*Military designation: PS*

***Description:*** At ambient temperature and pressure, chloropicrin is a colorless, oily liquid with an extremely sharp, sweet irritating odor. Chloropicrin is a hazard by vapor inhalation or by skin or eye contact with either vapor or liquid.

***Non-military uses:*** Chloropicrin is an extensively used industrial chemical that was formerly employed in World War I as a choking agent. It was first synthesized by Stenhouse in 1848 by reacting picric acid with chloride of lime. Also known as trichloronitromethane or nitrochloroform, chloropicrin has had extensive use as a fumigant for cereals and grains and as a fungicide. It has also been used commercially as a soil insecticide and to kill weeds and grass seed in soils. Chloropicrin is reportedly used in the chemical manufacturing process for methyl violet.

***Military use:*** Chloropicrin was stockpiled during World War I, generally in combination with other chemicals such as stannic chloride or phosgene. Although no longer maintained in the U.S. stockpile of chemical weapons, chloropicrin was once used to fill Livens projectiles, Stokes mortar rounds and artillery projectiles. These older weapons may be buried at abandoned waste sites around the continental United States. Also buried or abandoned were chemical agent identification sets, which may contain small ampoules of chloropicrin and chloroform in a 50:50 mixture. The Russian Federation still uses chloropicrin as a qualitative fit-testing substance for air-purifying respirators.

***Health effects:*** Chloropicrin is a powerful irritant that can cause immediate, severe inflammation of the eyes, nose and throat, as well as significant upper and lower respiratory tract injuries following acute exposure. High-level exposures to chloropicrin vapor are rapidly followed by burning of the nose and throat, coughing, shortness of breath, dizziness, nausea or vomiting, headache and extreme eye irritation. Following low-level exposures, symptoms usually subside within 15 minutes upon removal from exposure. Ocular symptoms may persist longer if the eyes are rubbed. Skin contact with chloropicrin vapor or liquid results in immediate burning or stinging pain followed by redness. Nausea and vomiting may be noted with chloropicrin exposures. Human exposure data for other types of choking agents suggest that acute lung damage from chloropicrin exposure could result in the development of chronic bronchitis, asthma and emphysema, particularly if recovery is complicated by respiratory tract infections. No animal or human epidemiologic data exists to suggest that chronic chloropicrin causes cancer in those exposed or developmental effects in the unborn fetus.

***Environmental fate:*** Chloropicrin is practically insoluble in water but is miscible in non-polar solvents such as benzene, carbon tetrachloride and chloroform. It will persist in groundwater or soil for moderate periods of time. However, because of chloropicrin's volatility and slow breakdown in water, it will not likely persist for many years in the environment.

For more information, contact the CMA Public Affairs Office at
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